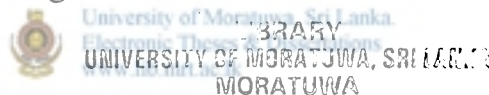


**ANALYSIS OF THE DEVELOPMENT OF
COLOMBO SEAPORT BASED ON
PRODUCTIVITY, PROFITABILITY AND
CAPACITY UTILIZATION
1980 - 2004**

By

W.S.PERERA

This dissertation was submitted to the Department of Management of Technology of the University of Moratuwa in partial fulfillment of the requirement for the degree of Master of Business Administration.



Supervised by : Dr.S.W.S.B.Dasanayaka

65-06"
62:65 6043

TH

**DEPARTMENT OF MANAGEMENT OF TECHNOLOGY
UNIVERSITY OF MORATUWA SRI LANKA
SEPTEMBER 2006**

University of Moratuwa



87872

87872

87872

Declaration

I certify that this does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any University to the best of my knowledge and belief if does not contain any material previously published written or orally communicated by other person or myself excepted when due reference is made in the text. I also hereby give consent for this dissertation. If accepted, to be made available for photocopying and for interlibrary loans, and for the title and summary to be made available to outside organization.

Signature of candidate:



Date: 15/10/2006

To the best of my knowledge, the above particular are correct.



Supervisor

Dr.S.W.S.B. Dasanayaka

Department of Management of Technology

Faculty of Engineering

University of Moratuwa

Moratuwa, Sri Lanka



University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations
www.lib.mrt.ac.lk

Acknowledgement

This dissertation was completed with the kind contribution of a lot of people however I would like to devote very special thank to a few for their kind valuable contribution extended to me to make this dissertation success.


First of all, I devote my special thank to my research supervisor Dr.S.W.S.B.Dasanayaka for his guidance, encouragement and support extended to make this research projects success. Also my sincere gratitude is extended to all the Faculty members of the course of Master of Business Administration in the Department of Management of Technology, University of Moratuwa.

Last but not least, I wish to thank all the members of the Sri Lanka Ports Authority and various other organizations who extended valuable help to me in carrying out my research data collection.



University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations
www.lib.mrt.ac.lk

**ANALYSIS OF THE DEVELOPMENT OF
COLOMBO SEAPORT BASED ON
PRODUCTIVITY, PROFITABILITY AND
CAPACITY UTILIZATION
1980-2004**

 University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations
MBA IN MOT 2003/2005
UNIVERSITY OF MORATUWA
September 2006

W . S . PERERA
03/9028

Abstract

The Colombo Seaports will play a key role in economic activities of Sri Lanka utilizing its strategic location in the main sea route on the Indian Ocean. Sri Lanka needs to reach the highest level in port management and rendering services to its customers to comparing other ports in the region. Even at present, the Port of Colombo handling two millions containers and earns huge revenue which will vastly contribute to the development of the country and generating employment around twenty seven thousands workers who come from all parts of the country.

In considering the ongoing competition of the region's shipping industry, it is the right time for policy makers to keep at least one step ahead of its other competitors to be in line with the port development and productivity aspects. This may help to derive most of the direct and indirect benefits which Sri Lanka seaports and their business activities have not yet been fully realized. Keeping in mind that port of Colombo can be brought to the standards of Singapore and Hong Kong if proper plans work out. Hence it is the duty of all stake holders, the policy maker's, business leaders and every citizen of the country to act with the view to making "The Mega hub port" concept a reality within next five years.

During the second half of the British occupation of Ceylon, Colombo seaport acquired a reputation as the major shipping centre of the Indian ocean and the seventh largest port in the world, in considering the tonnage handled during the inter war period. But, after the political independence in 1948 there was a decline in the port activities owing to the inward looking policies of the South Asian region and the lack of investment to cope with the maritime sector technological development and seaport infrastructure. After economic and shipping policy reform in 1977 and 1990, the Colombo seaport showed an impressive growth. Port of Colombo has been ranked as the best managed and most efficient hub port in the South Asian region.

Considering above factors first, this analysis based on the Cobb-Douglas production function showed that Colombo seaport has had increasing return to scale during the last twenty five years. The return to scale depends largely on the demand for seaport service, and on corresponding developments. Second, analyses the profitability of operations in the Colombo seaport based on the productivity analysis. The average profitability measures of ($W < MPPI$ and $r\% < MRPK \%$) prove to be well above the acceptable limits. Third, analyses the capacity utilization of the Colombo seaport during the last twenty-five years. This analysis shows that the annual rate of increase of tonnage and container handling in the Colombo seaport has been positive, and that the rate has increased over time at an increasing rate. In economic terms, when a firm experiences full capacity utilization, it operates in the minimum area of the long-run cost curve. The forecast of future demand for port services based on SWOT analysis is necessary before making any final decision to expand seaport facilities.

CONTENTS

Abstract	ii
List of Tables	vi
List of Figures	vii
List of Maps	viii
Acronyms and Abbreviations	ix
 Chapter 1. Introduction	 1
1.1 Introduction	1
1.2 Background to the Study	3
1.3 The importance of the Subject	5
1.4 Objectives	6
1.5 Methodology	6
1.6 Organization of the study	7
1.7 Limitations of the study	7
 Chapter 2. Literature survey and historical view of ports around the world	 9
2.1 European seaport's container operations and port services	9
2.1.1 Recent trends in maritime and port industries	9
2.1.2 Market structure of port terminal operators	13
2.1.3 Improving profits through product differentiation	17
2.1.4 Conclusions	22
2.2 The recent seaport development	26
2.2.1 The main recent trends affecting seaport development.	26
2.2.2 The Evolution of Modern Seaports	30
2.2.3 Grater Environment of Ports Industry	33
2.2.4 Characteristics of Mega Ports	33
2.2.5 Existing capacity	34
2.2.6 Conclusions	36
 Chapter 3. Ascertain the Development of Colombo Seaport in Term of Various Seaport Indicators.	 40
3.1 Location and recent history of the port	40
3.2 Strategies adopted for the trans-shipment business	40
3.3 Development of containerization	41
3.3.1 Conceiving the idea of container terminals	41
3.3.2 Creation of the Sri Lanka Ports Authority	42
3.3.3 Setting up the first terminal: Queen Elizabeth Container Terminal (QCT)	43
3.3.4 Colombo gaining trans-shipment hub status	46
3.4 Development of container operations	47
3.4.1 Liberalization of the industry	47
3.4.2 The pressures from container carriers	48

3.4.3 Competition	50
3.5 The situation at the beginning of 2000	51
3.5.1 The National Ports and Shipping Policy of 1997 and its Impact on container operations	51
3.5.2 Recent Development of Colombo's Container Market	52
3.5.3 ISC Market Characteristics	54
3.5.4 Colombo transshipment market	56
3.6 Plan of the Port of Colombo	57
3.7 Privatization of container terminals	57
3.8 Conclusions	59
Chapter 4. Analysis of the development of Colombo seaport base productivity, profitability and capacity utilization 1980 – 2004	62
4.1 Scale of operation analysis based on the production function	62
4.1.1 Estimation of the production function for the major Sri Lanka Seaport	63
4.1.2 The economic interpretation	64
4.1.3 Estimation of models for the Colombo Seaport	66
4.1.4 Effectiveness and efficiency of container operation	67
4.1.5 Productivity measurement of seaports	68
4.2 Analysis of Profitability of Colombo Seaport	69
4.2.1 Productivity based profitability analysis for the Colombo seaport	69
4.2.2 Profitability analysis for the Colombo seaport 1980 – 2005	70
4.2.3 Profitability ratios of Colombo seaport	71
4.3 Analysis the Capacity Utilization of Colombo Seaport	71
4.4 Conclusions	73
Chapter 5. The SWOT analysis to determine the future of Colombo seaport	75
5.1 Identification of the strength, weakness emerging opportunities In addition, threats for Colombo seaport.	75
5.1.1 Strength that influence the Colombo seaport to Become the hub port in South Asia.	78
5.1.2 Weakness in the Colombo seaport	80
5.1.3 Opportunities for the Colombo seaport	83
5.1.4 Possible threats of Colombo seaport	86
5.1.5 Conclusion	89
Chapter 6. General discussions, results of the study, policy implications, an agenda for action-oriented research and strategies for future sustainable development	90
6.1 General discussions	90
6.2 Results of the study	92
6.3 Policy implications	93
6.4 An agenda for action-oriented research	96
6.5 Conclusions	97

APPENDICES

A1 Tables	99
A2 Figures	124
A3 Maps	135
A4 Questionnaires	155

BIBLIOGRAPHY

167



University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations
www.lib.mrt.ac.lk

LIST OF TABLES

No.		Page
01	Comparative profitability	14
02	Throughputs capacity of existing port	35
03	Composition of container traffic 1995-2003	53
04	Key characteristic of ISC container markets	55
05	SAGT performance 2000-2004	58
06	Average productivity (Vessels/Birth/Cranes)	68
TABLES IN APPENDIX - A1		99
01	Major lines/ services calling at European container terminals	100
02	Main dedicated and semi-dedicated container terminal in Europe	102
03	Tariff estimation for container manipulation	103
04	Major terminal operators in the world and Europe	104
05	Increase in container handling at QCT 1980-2004	106
06	Increase in transshipment throughput 1980-2004	107
07	Characteristics and competitions features of the main Competing ports	108
08	Key characteristic of ISC container markets	109
09	Estimation of the production function	110
10	Estimation of the production function for the Colombo seaport	111
11	Average port productivity (small and Large Vessels)	112
12	Time consuming chart of each crane	113
13	Total moves of each crane	113
14	Comparison of monthly (TEUs) – JCT, SAGT.and all	114
15	Estimation of productivity base profitability functions	115
16	Profitability analysis for the Colombo 1980-2004	116
17	Variation of revenue in the port of Colombo due to transshipment Business for the period of 1980 -2004	117
18	Profitability ratios analysis	117A
19	Data analysis for capacity utilization of Colombo seaport	118
20	Calculation of preferred tonnage for the period of 1980 – 2004	119
21	The derived ratios of Actual to preferred tonnage	120
22	Facilities at existing container terminals	121
23	Facilities at JCT 1 and 2	122
24	Facilities at JCT 3 and 4	122
25	Birth/Quay average occupancy rate for the period of 1977 – 2004	123

LIST OF FIGURES

No.		Page
01	The equilibrium of stackelborg in the case of duopoly	15
02	Colombo container traffic profile 1995-2003	52
03	Colombo share of ISC transshipment market 1998-2002	53
04	Distribution of Colombo's ISC transshipment traffic by country	56
05	Total tonnage handled	72
06	Critical minimum point (CMP) in SWOT analysis	76

FIGURES IN APPENDIX - A2

124

01	Strategic location of Colombo port	125
02	Total container throughput (TEUs) port of Colombo	125
03	Cost of deviation and port of call (US\$)	126
04	Cost of transportation	126
05	Ports costs for a 3,500 TEUs vessels (US\$)	126
06	Operational cost of vessels (US\$)	127
07	Mega container carriers	127
08	Cost of deviation from East-West route	127
09	Port of Colombo comparative advantage	128
10	Colombo's advantage and disadvantage	128
11	Eviews analysis for production function of all ports	129
12	Eviews analysis for production function of all ports	129
13	Eviews analysis for production function of Colombo port	130
14	Eviews analysis for production function of Colombo port	130
15	Eviews analysis for productivity base profitability function	131
16	Eviews analysis for capacity utilization of Colombo seaport	131
17	Organizational structure of JCT	132
18	Terminal services agreement with JCT-SLPA	133
19	Competitors of Colombo port	134

MAPS IN APPENDIX - A3

No.		Page
01	Strategic location of port of Colombo	136
02	Ports in Sri Lanka	137
03	Dream of Colombo seaport	138
04	Future mega hub concept	139
05	Colombo port in 1930	140
06	Colombo port in 1931	140
07	Colombo port in 1950	141
08	Colombo seaport recent development	141
09	General plan of Colombo seaport	142
10	Deepening of hurbour basin	142
11	Boom extension	143
12	JCT proposal for improvement	144
13	Infrastructure development of Colombo seaport	145
14	Equipment superstructure	145
15	North Channel dredging	146
16	Plan of Colombo seaport constructions	146
17	Plan of Colombo south harbour development	147
18	Capacity building of Colombo seaport	147
19	Port of Hambantota	148
20	Hambantota satellite view	148
21	Proposal location for Hambantota port	149
22	Port layout plan	149
23	Layout plan of tourism zone	150
24	Layout plan for industrial zone	150
25	Trincomalee ocean city	151
26	Trincomalee ocean city development	151
27	Port of Galle	152
28	JICA implementing plan	152
29	Tank farm and bunkering facility of port of Galle	153
30	Port of Kankasanturai	153
31	Port of Point pedru	154
32	Port of Oluvil	154

ACRONYMS AND ABBREVIATIONS

ADB	- Asian Development Bank
APMT	- AP Moeller Terminals
CASA	- The Ceylon Association of Ships Agents
CPC	- Ceylon Petroleum Corporation
CSH	- Colombo South Harbour
ECNA	- East Coast North America
EIU	- Economic Intelligence Unit
EPC	- Engineer/ Procure/Construct
EIRR	- Economic Internal Rate of Return
EDI	- Electronic data interchange
EIA	- Environmental impact assessment
FIRR	- Financial internal rate of return
FIRR	- Financial Internal Rate of Return
GDP	- Gross Domestic Product
ISA	- Initial social analysis
IRR	- Internal Rate of Return
ISC	- Indian Sub Continent
ISO	- International Standards Organization
JBIC	- Japan Bank for International Cooperation
JCT	- Jaya Container Terminal
JNP	- Jawaharal Nehru Port
MPDDS	- Ministry of Port Development and Development of the South
NPV	- Net present value
NSICT	- Nhava Sheva International Container Terminal
PMU	- Project management unit
QEQ	- Queen Elizabeth Quay
PIANC	- International Navigation Association
SAGT	- South Asia Gateway Terminal
SHDP	- South Harbor Development Project
SHDT	- South Harbor Development Team
SLPA	- Sri Lanka Ports Authority
TA	- Technical Assistance
TEU	- Twenty-foot equivalent unit
UCT	- Unity Container Terminal

